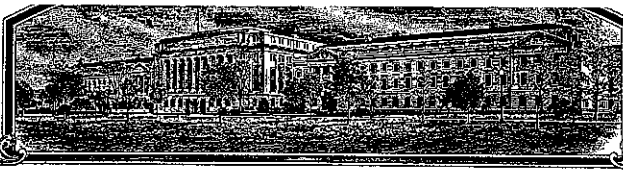


No.

200100057



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

California Cooperative Rice Research Foundation, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR PLANT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED, AND SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, 7 U.S.C. 2321 ET SEQ.)

RICE

'M-104'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this tenth day of November, in the year two thousand and four.

Attest:

*[Signature]*

Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

*[Signature]*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE  
(Instructions and information collection burden statement on reverse)

The following state parts are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER California Cooperative Rice Research Foundation, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME 95-Y-214		3. VARIETY NAME M-104	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Rice Experiment Station P. O. Box 306 955 Butte City Hwy. Biggs, CA 95917-0306		5. TELEPHONE (Include area code) 530-868-5481		FOR OFFICIAL USE ONLY PVPO NUMBER 20010005	
		6. FAX (include area code) 530-868-1730		FILING DATE 12/28/2000	
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Non-profit organization		8. IF INCORPORATED, GIVE STATE OF INCORPORATION CA		9. DATE OF INCORPORATION 1912	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Dr. Kent S. McKenzie Director Rice Experiment Station P. O. Box 306 Biggs, CA 95917-0306				FILING AND EXAMINATION FEES: \$ 2705 DATE 12/28/2000 CERTIFICATION FEE: \$ 432.00 DATE 10-5-04	
11. TELEPHONE (Include area code) 530-868-5481		12. FAX (Include area code) 530-868-1730		13. E-MAIL ksmckenzie@crrf.org	
14. CROP KIND (Common Name) Rice		15. GENUS AND SPECIES NAME OF CROP Oryza sativa L.		16. FAMILY NAME (Botanical) Gramineae	
17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office) \$2705			
19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input checked="" type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input type="checkbox"/> NO (If "no", go to item 22)		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
21. IF "YES" TO ITEM 20, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED		22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)			
23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES RAO 9/4/02 <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)		24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER Kent S. McKenzie		SIGNATURE OF OWNER			
NAME (Please print or type) Kent S. McKenzie		NAME (Please print or type)			
CAPACITY OR TITLE Director		DATE 12/21/00		CAPACITY OR TITLE	
				DATE	

# INSTRUCTIONS

200100057

**GENERAL:** To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$2,450 (\$300 filing fee and \$2,150 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. DO NOT use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$300 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvp.htm>

## ITEM

- 18a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) evidence of uniformity and stability; and (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
  - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
  - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (seed of this variety be sold by variety name only, as a class of certified seed), the applicant MAY NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

M-104 was jointly released by California Cooperative Rice Research Foundation, California Agriculture Experiment Station, and USDA-ARS March 21, 2000. Foundation seed was first distributed to California rice seed producers April 11, 2000 for planting in 2000.

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

M-104 was issued US Patent No. 6,495,746 issued 17 Dec. 2002

Rad 9/4/2004

**NOTES:** It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center—East, Beltsville, MD 20705. Telephone: (301) 504-8089.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your order. Under the PRA of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-2791. To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD). USDA is an equal opportunity employer.

5&T-470 (6-96) designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (03-96) which is obsolete.

**'M-104' Rice****18a. Exhibit A. Origin and Breeding History of the Variety****1) Genealogy**

M-104 is a very early, semidwarf, California glabrous, Calrose quality medium-grain experimental variety that has been evaluated in large plot yield tests since 1995 under experimental designation 95-Y-214. It is a very early selection from the 1990-1991 winter greenhouse cross R17135 and has the pedigree M-103//F<sub>1</sub> (90-Y-275/M-103), thus the full pedigree is M-103/6/M-102/4/M201/3/M7/M9//M7/5/M-103. All varieties used in the pedigree were developed by the California Cooperative Rice Research Foundation (CCRRF) at the Rice Experiment Station (RES), Biggs, CA. They all are considered Calrose medium-grains with semidwarf height. 90-Y-275 was a very early experimental line and has the pedigree M-102/4/M201/3/M7/M9//M7. It was derived from the cross of a previous line (M201/3/M7/M9//M7) tested in statewide yield tests. The male F<sub>1</sub> identified as R16618 was made in the 1990 summer greenhouse. Only M-103 is currently in commercial production in California. M-104 is the product of modified pedigree breeding. Very early spray painted panicle selections from the 1992 F<sub>2</sub> nursery were bulked 6 panicles per row in the 1992-1993 Hawaiian nursery. Panicle selections grouped from the R17135 Hawaii rows were planted in 1993 individual rows. 93 row 63633 was identified as the source of 1994 small plot 83 which produced seed for 95-Y-214 RES Preliminary Yield Trial. It has been tested in the University of California Cooperative Extension (UCCE) Statewide Yield Tests from 1996 to 1999.

**2) Selection and multiplication**

M-104 selection was made for earliness of M-103 and for higher seed weight similar to other Calrose medium grains. Panicle selections were first taken for headrow production in 1996 and continued through 1999. The 1996 panicles were initially purified in the 1997 headrow nursery. The 1997 headrows were bulked to plant the breeder seed increase and headrow panicles selected for 200 headrows in 1998. The 1998 breeder seed was used to plant the 1999 foundation seed and the bulk of 1998 headrows planted the 1999 breeder production area. The 1998 head row panicle selections were used to plant 400 headrows in 1999.

**3) Uniformity and stability**

Panicle selections were first taken for headrow production in 1996 and continued through 1998. During the headrow production any putative segregating or variant rows were removed from the field. Visual inspection (seedling vigor, heading date, plant height, grain shape and size, etc.) of headrows were used as criteria to confirm cultivar purity. This is standard procedure at RES to monitor and maintain breeder seed of the 13 currently grown California rice varieties. M-104 was approved for certification by the California Crop Improvement Association in 2000. Classes of seed will be breeder, foundation, registered, and certified seed produced in California. Foundation seed can be used to produce foundation seed if necessary and headrow and breeder seed will be produced in foundation fields as necessary to maintain cultivar purity. M-104 has been observed in seed increase

and production fields for three generations (1996 to 1998) and found to be uniform and stable.

4) **Variants**

The breeder, foundation, and headrows were rogued multiple times and off-types, putative out crosses, and other visual variants were removed from the field. These included smooth, slightly later, taller medium grains, glabrous longer medium grains from possible outcrossing, elongated upper internodes, pubescent medium-grains and pubescent short grains in a total frequency of 0.02%.

**18b. Exhibit B. Statement of Distinctiveness****1) Variety Differences**

M-104 is a semidwarf, very early maturing, medium-grain being released to serve the Calrose medium-grain market. "Calrose" was the founding California medium-grain rice variety, the ancestor of California medium-grains, and is now recognized as a market class term for California medium-grain rice. Comparisons for evaluation purposes were made to M-103 and M-202, which are similar quality types. M-104 has a heavier 1000 grain weight than M-103 and is earlier than M-202. M-104 is most similar to M-103 and can be distinguished by its higher brown rice kernel weight.

**2) Statistical data**

**Agronomic characteristics:** Agronomic characteristics (seedling vigor through yield) were collected in multiple location University of California Cooperative Extension (UCCE) Statewide Yield Tests in 1996 to 1999 are summarized in Table 1. M-104 is significantly earlier than M-202. Tables 2 & 3 show individual year statistical evidence collected from replicated large plot yield tests at RES.

**Grain characteristics:** Various grain characters were collected at RES 1997 to 1999. M-104 1000 grain weight (g) is similar to M-202 and significantly larger than M-103 (Table 1).

Table 1. Summary of agronomic characteristics for M-103, M-104, and M-202, 1995-1999.

Character	M-103	M-104	M-202
Seedling vigor score†	4.3	4.4	4.5
Days 50% heading	80	80*	88
Plant height (cm)	92	91	98
Lodging (%)	49	37	43
Blanking – Greenhouse	22	21	24
Blanking – Davis	7	16	12
Blanking – San Joaquin	8	13	18
Overall blanking mean	12	17	18
Stem rot (score)	5.4	5.4	5.2
Harvest moisture (%)	18.8	18.2	21.4
Yield (lb/acre @ 14%)	8087	*8801	8790
Total milled rice (%)	68.1	67.8	67.2
Whole kernel milled rice (%)	63.4	63.1	61.0
Brown Rice 1000 grain wt (g)	22.1	*24.4	24.0
Brown Rice length (cm)	5.8	6.4	6.2
Brown Rice width (cm)	2.7	2.9	3.0
Ratio (L/W)	2.15	2.21	2.06

† Seedling vigor visual score where 1=poor and 5=excellent.

\* Significantly different from the respective check variety at the 0.05 probability level.

Table 2. 2000 to 2002, 1000 brown rice kernel weight (g) of M-103, M-104, and M-202 at the Rice Experiment Station, Biggs, CA.

Year	M-103 (g)	M-104 (g)	M-202 (g)	LSD (0.05)
2000	22.6	24.4*	23.9	1.0
2001	22.7	24.0*	23.7	1.1
2002	21.1	23.9*	23.1	1.0

\* Significantly different from M-103 at the 0.05 probability level.

Table 3. Days to 50% flowering for M-103, M-104, and M-202 from 1995 to 1999 at the Rice Experiment Station, Biggs, CA.

Year	Trial	M-103 (d)	M-104 (d)	M-202 (d)	LSD
1995	Very, very early preliminary	79	77*	84	2
1996	Very early county	76	75*	89	1
1997	Very early county	79	79*	94	1
1998	Very early county	76	76*	86	2
1998	Early county	77	76*	83	2
1999	Very early county	86	83*	97	3
1999	Early county	82*	79*	95	2

\* Significantly different from M-202 at the 0.05 probability level.

1 = Erect (less than 30°)    3 = Intermediate (about 45°)    5 = Open (about 60°)  
7 = Spreading (more than 60° but the culms do not rest on the ground)  
9 = Procumbent (the culm or its lower part rests on the ground surface)



## LENGTH

8 0 0 cm (Soil level to top of extended panicle on main stem)1 0 cm Shorter than Check variety: M-103

Length same as Check variety: \_\_\_\_\_

       cm Longer than Check variety: \_\_\_\_\_1 HEIGHT CLASS: 1 = Semidwarf 2 = Short 3 = Medium 4 = Tall1 INTERNODE COLOR (After flowering): 1 = Green 2 = Light Gold 3 = Purple lines 4 = Purple3 STRENGTH (Lodging resistance): 1 = Strong (no lodging) 3 = Moderately strong (most plants leaning)  
5 = Intermediate (most plants lodged) 7 = Weak (most plants flat)  
9 = Very weak (all plants flat)

## 3. FLAG LEAF (After Heading):

2 5 6 cm LENGTH 1 2 2 mm WIDTH1 PUBESCENCE: 1 = Glabrous 2 = Intermediate 3 = Pubescent1 LEAF ANGLE (after heading): 1 = Erect 3 = Intermediate 5 = Horizontal 7 = Descending2 BLADE COLOR: 1 = Pale Green 2 = Green 3 = Dark Green 4 = Purple tips  
5 = Purple margins 6 = Purple blotch 7 = Purple1 BASAL LEAF SHEATH COLOR: 1 = Green 2 = Purple lines 3 = Light purple 4 = Purple

## 4. LIGULE:

       mm LENGTH (from base of collar to the tip, at late vegetative stage)1 COLOR (Late vegetative state): 1 = White 2 = Purple lines 3 = Purple1 SHAPE: 1 = Acute to acuminate 2 = 2-Cleft 3 = Truncate1 COLLAR COLOR (late vegetative stage): 1 = Pale green 2 = Green 3 = Purple1 AURICLE COLOR (late vegetative stage): 1 = Pale green 2 = Purple

## 5. PANICLE:

1 8 2 cm LENGTH9 TYPE: 1 = Compact 5 = Intermediate 9 = Open2 SECONDARY BRANCHING: 1 = Absent 2 = Light 3 = Heavy 4 = Clustering3 EXSERTION (near maturity): 1 = Less than 90% 2 = 90 - 99% 3 = 100% exerted2 AXIS: 1 = Straight 2 = Droopy1 SHATTERING: 1 = Very low (less than 1%) 3 = Low (1 - 5%) 5 = Moderate (6 - 25%)  
7 = Moderately high (26 - 50%) 9 = High (more than 50%)3 THRESHABILITY: 1 = Difficult 2 = Intermediate 3 = Easy

## GRAIN (Spikelet):

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- 1 AWNS (after full heading): 0 = Absent 1 = Short and partly awned 5 = Short and fully awned  
7 = Long and partly awned 9 = Long and fully awned
- 2 APICULUS COLOR (at maturity): 1 = White 2 = Straw 3 = Brown (tawny) 4 = Red  
5 = Red apex 6 = Purple 7 = Purple apex
- 1 STIGMA COLOR: 1 = White 2 = Light green 3 = Yellow 4 = Light purple 5 = Purple
- 0 LEMMA AND PALEA COLOR (at maturity):  
0 = Straw 1 = Gold and/or gold furrows on straw background 2 = Brown spots on straw (piebald)  
3 = Brown furrows on straw 4 = Brown (tawny) 5 = Reddish to light purple  
6 = Purple spots on straw 7 = Purple furrows on straw 8 = Purple  
9 = Black 10 = White
- 2 LEMMA AND PALEA PUBESCENCE: 1 = Glabrous 2 = Hairs on lemma keel 3 = Hairs on upper portion  
4 = Short hairs 5 = Long hairs (velvety)
- 1 SPIKELET STERILITY (at maturity): 1 = Highly fertile (>90%) 3 = Fertile (75-90%) 5 = Partly sterile (50-74%)  
7 = Highly sterile (<50% to trace) 9 = Completely sterile (0%)

## GRAIN (Seed):

- 2 SEED COAT (bran) COLOR: 1 = White 2 = Light brown 3 = Speckled brown 4 = Brown  
5 = Red 6 = Variable purple 7 = Purple
- 1 ENDOSPERM TYPE: 1 = Nonglutinous (nonwaxy) 2 = Glutinous (waxy) 3 = Indeterminate
- 1 ENDOSPERM TRANSLUCENCY: 1 = Clear 5 = Intermediate 9 = Opaque
- 1 ENDOSPERM CHALKINESS: 0 = None 1 = Small (less than 10% of sample)  
5 = Medium (10-20% of sample) 9 = Large (more than 20% of sample)
- 0 SCENT (Aroma): 0 = Nonscented 1 = Lightly scented 2 = Scented

## SHAPE CLASS (length/width ratio):

- 2 PADDY 1 = Short (2.2:1 and less) 2 = Medium (2.3:1 to 3.3:1) 3 = Long (3.4:1 and more)
- 2 BROWN 1 = Short (2.0:1 and less) 2 = Medium (2.1:1 to 3.0:1) 3 = Long (3.1:1 and more)
- 2 MILLED 1 = Short (1.9:1 and less) 2 = Medium (2.0:1 to 2.9:1) 3 = Long (3.0:1 and more)

## MEASUREMENTS:

Grain Form	Length (mm)	Width (mm)	Thickness (mm)	L/W Ratio	1000 Grains (grams)
Paddy	<u>8.4</u>	<u>3.3</u>	<u>      </u>	<u>2.55</u>	<u>28.1</u>
Brown	<u>6.4</u>	<u>2.9</u>	<u>      </u>	<u>2.21</u>	<u>24.4</u>
Milled	<u>5.9</u>	<u>2.6</u>	<u>      </u>	<u>2.26</u>	<u>21.5</u>

- 19.4 Milling quality (% hulls) 63.1 Milling yield (% whole kernel (head) rice to rough rice)
- 6.4 % Protein 16.2 % Amylose

Alkali Spreading value: 6 1.5% KOH Solution 6.5 1.7% KOH Solution

7 GELATINIZATION TEMPERATURE TYPE: 1 = High 5 = Intermediate 7 = Low

Amylographic Paste Viscosity (Brabender Units)

Peak Hot Paste Cooled Paste 'Breakdown' 'Setback'

284236321

## RESISTANCE TO LOW TEMPERATURE:

3 GERMINATION AND SEEDLING VIGOR: 1 = Low 2 = Medium 3 = High

3 FLOWERING (Spikelet fertility): 1 = Low 2 = Medium 3 = High

## SEEDLING VIGOR NOT RELATED TO LOW TEMPERATURE:

3 VIGOR: 1 = Low 2 = Medium 3 = High

0. BLAST RESISTANCE (*Pyricularia Oryzae*). (International races found under references)

0 = Immune 1 = Resistant 3 = Moderately resistant 5 = Intermediate 7 = Moderately susceptible 9 = Susceptible

Group	IB					IC		ID	IE		IG	IH
Number	1	5	45	49	54	1	17	1	13	1	1	1
Resistance	—	—	—	—	—	—	—	—	—	—	<u>7</u>	—

## 1. RESISTANCE TO OTHER DISEASES:

0 = Immune 1 = Resistant 3 = Moderately resistant 5 = Intermediate 7 = Moderately susceptible 9 = Susceptible

<u>      </u>	Narrow Brown Leaf Spot <i>Cercospora oryzae</i>	<u>5</u>	Aggregate Sheath Spot <i>Rhizoctonia oryzae-sativae</i>
<u>      </u>	Leaf Smut <i>Entyloma oryzae</i>	<u>      </u>	Straight Head
<u>      </u>	Brown Leaf Spot <i>Helminthosporium oryzae</i> (= <i>Bipolaris oryzae</i> ) (= <i>Drechslera oryzae</i> )	<u>      </u>	Kernel Smut <i>Neovossia horrida</i> (= <i>Tilletia barclayana</i> )
<u>      </u>	Leaf Scald <i>Gerlachia oryzae</i>	<u>      </u>	White Tip Nematode <i>Aphelenchoides besseyi</i>
<u>      </u>	Hoja Blanca Virus	<u>5</u>	Stem Rot <i>Sclerotium oryzae</i>
<u>      </u>	Sheath Rot <i>Sarocladium oryzae</i>		
<u>      </u>	Pythium Seedling Blight <i>Pythium</i> sp.	<u>      </u>	Bacterial Blight <i>Xanthomonas campestris</i> pv. <i>oryzae</i>
<u>      </u>	Sheath Spot <i>Rhizoctonia oryzae</i>	<u>      </u>	Sheath Blight <i>Rhizoctonia solani</i>
<u>      </u>	Other: _____		

## 2. INSECT RESISTANCE:

0 = Immune 1 = Resistant 3 = Moderately resistant 5 = Intermediate 7 = Moderately susceptible 9 = Susceptible

<u>      </u>	Grasshopper	<u>      </u>	Rice Stink Bug <i>Oebalus pugnax</i>
<u>      </u>	Rice Leafhopper	<u>      </u>	Swarm Caterpillar
<u>      </u>	Rice Hispa	<u>9</u>	Rice Water Weevil <i>Lissorhoptrus oryzophilus</i>
<u>      </u>	Rice Midge	<u>      </u>	Rice Stalk Borer <i>Chilo plejadellus</i>
<u>      </u>	Least Skipper	<u>      </u>	Sugarcane Borer <i>Diatraea saccharalis</i>

13. OTHER DESCRIPTORS: If there are other characters that describe this variety, please indicate below: 200100057

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#### REFERENCES

1. C. R. Adair *et al.* 1972. Rice in the United States: Varieties and Production. USDA Handbook No. 289 (Rev.), 124 pp.
  2. J. G. Atkins *et al.* 1967. An International Set of Rice Varieties for Differentiating Race of *Pyricularia Oryzae*. *Phytopath.* 57:297-301.
  3. IBPGR-IRRI Rice Advisory Committee. 1980. Descriptors for Rice *Oryza sativa* L.). International Rice Research Institute. 21 pp.
  4. K. C. Ling and S. H. Ou, 1969. Standardization of the International Race Numbers of *Pyricularia Oryzae*. *Phytopath.* 59:339-342.
  5. B. D. Webb *et al.* 1985. Utilization Characteristics and Qualities of United States Rice. In Proceedings on Rice Grain Quality and Marketing. International Rice Research Institute (IRRI), Los Banos, Philippines. p. 25-35.
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Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

**EXHIBIT E**  
**STATEMENT OF THE BASIS OF OWNERSHIP**

1. NAME OF APPLICANT(S)  California Cooperative Rice Research Foundation, Inc.	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER  95-Y-214	3. VARIETY NAME  M-104
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country)  Rice Experiment Station P. O. Box 306 Biggs, CA 95917-0306	5. TELEPHONE (include area code)  530-868-5481	6. FAX (include area code)  530-868-1730
	7. PVPO NUMBER  200100057	

8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. ☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company?  
If no, give name of country ☒ YES ☐ NO

10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

☐ YES ☐ NO If no, give name of country

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (if needed, use reverse for extra space):

M-104 was developed by Dr. Carl W. Johnson who is a plant breeder employed by the California Cooperative Rice Research Foundation, Inc. (CCRRF).

**PLEASE NOTE:**

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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